An Introduction to the Trades: A Positive Spin on Typically 'Negative' Occupations

An Honors Thesis (HONR 499)

by

Michale DeLong

Thesis Advisor

Dr. Jennifer Warrner

Ball State University

Muncie, Indiana

December 2019

Expected Date of Graduation

May 2020

Abstract

From the very first home constructed to today's skyscrapers and dauntingly massive warehouses, tradesmen were critical players on the teams that make development possible. Those who are agile with their hands and those gifted with the mechanics of making complex solutions a reality are the lynchpins creating the homes that we walk into at night, and the buildings we frequent for work, school, shopping and entertainment during the day. Unfortunately, when considering careers, the current mindset does not recognize trades workers as skilled professionals, deeming them inferior to those with college degrees. This mindset results in minimizing the pool of eligible candidates from joining the field in favor of enrolling in college. This switch in mentality is beginning to severely impact the construction industry as there is a sharp decrease in able and willing persons to fill the numerous openings in the trades. Unless we begin to introduce the trades to the younger generation in a compelling format, the future of construction may have a rather bleak outcome. The aim of this thesis work is to introduce the trades as a viable and attractive option when considering what to do when one grows up. Utilizing the lesson plans created for younger generation classrooms will stimulate interest that can be nurtured throughout formative years thus introducing attractive options prior to expectations of college being considered the only path forward. The emphasis on the importance of the work and the professionalism associated with the trades will encourage respect for the roles and improve interest in areas to create a fully staffed workforce for the future.

Acknowledgments

I would like to thank Dr. Jennifer Warrner for advising me not only through this project, but through my four years at Ball State. Her help during this final task allowed me to not only believe I can make a difference in the future, but gave me the gateway of which to do so.

Next, I would like to thank my grandmother Mary Miller for being my rock and person to talk to when I think I have overloaded my plate. She always offers an open ear, and gives me advice that while I may not like right away I know I need to hear. Without her, I would not be the young woman I am today and would not be completing my college career. Lastly I would also like to thank the Construction Management professors I have had throughout my years at Ball State for encouraging me to be better than my current self, and pushing me out of my comfort zone on numerous occasions to make me better.

Table of Contents

Process Analysis Statement

The outcome of this thesis is to provide the necessary lesson plans for instructors of kindergarten or first grade students to pique interest in careers within professional trades which are necessary to staff the future needs of the construction industry.

The process followed in order to produce the necessary outcome is to present visually stimulating elements of the construction industry in order for the students to gain an understanding of the industry. During the introduction to the construction industry, the lessons will engage auditory senses through stories, visual senses through the use of videos and flashcards, and kinesthetic senses through group activities. Tools such as flash cards and games will be used to expand knowledge and familiarize the students with the vocabulary to comprehend the roles within the industry. Target duration for each session will be 90 to 120 minutes, with changes in activities every 10 to 20 minutes to ensure attention is not lost within a set boundary based upon the target audience age range.

The introduction phase of the 15 week course will last for the first three weeks. This facet of the course will introduce construction as an industry, impart an understanding that there are many types of materials leveraged in the industry, present the concept of demolition, focus on the importance of safety and acquaint students with some of the various tools used for building. This introduction will stimulate interest in areas that were previously unknown and emphasize the importance and prestige of the trades roles within the industry.

Weeks four to thirteen shifts the focus to a deeper dive into the various trade careers within the industry. Each role will be covered during two 60 to 90 minute sessions. Changes in activities will take place every 10 to 20 minutes to ensure that the students remain actively engaged. Students will be presented with why the role is important, what the world would be like without each role, the tools and equipment leveraged by each role, and what the role is like on a daily basis. Stories, videos, games, group activities and visits from professionals that work in the industry will keep auditory, visual and kinesthetic senses engaged.

The final two weeks will bring all facets of the construction industry together. Lessons for the two final weeks will focus on the importance of teamwork, a review of what was previously covered and will introduce the exciting types of buildings that are a part of our communities. The emphasis in the final four sessions over two weeks will be on building excitement around the possibility of being a part of the team that makes our lives and our dreams become a reality, as almost everything we do requires the construction of a structure to accommodate the desired function. Sessions will consist of 90 minute sessions that will include stories, role play, activities, videos and games in order to engage all of the senses. Activities will last 10 to 20 minutes to ensure active engagement by the students.

Week One Lesson Plan

Day One – Introduction to Construction

Learning Objectives

Students will be able to define what construction is, and begin to understand the importance of building.

Materials and Preparation

- Class set of building blocks
- Copy of "Construction" by Sally Sutton
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side used as instructor talking points)
- *Optional – set of Legos to be given out with praise and for prizes during the games. Collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start the unit by introducing the word 'construction' and its simplified definition, 'to build'. Before giving the definition, ask if any of the students know what construction means.
- Have the students repeat both halves of the definition a few times to gauge their comfort level with the concept.
- Introduce flash cards 40-50 as examples of the types of buildings that need to be constructed
    - Use the Notes side of the flash card as talking points with the students

Practical Exposure (10 minutes)

- With large building blocks or Legos, have the students build towers.
    - Instructions Narrative: Playing with building blocks/Legos is similar to construction because you are building something. You can build a tower, a boat, or even a house! Today I want you all to build the tallest tower you can. Try to keep it standing!
- The tallest tower that stays standing receives praise.
    - May also receive a Lego to be collected throughout the course and used as an activity during the final session.

Story Session (20 minutes)

- Read "Construction" by Sally Sutton, published in September 1986.
- Once the book is complete, re-introduce the word construction. Ask if anyone remembers what it means.

Snack (10 minutes)

- Provide 2 pieces of circular cheese and 4 Ritz crackers per student.
- Have students stack crackers and cheese to "build" their own sandwich.
- Explain while building the sandwich that keeping the sandwich together is important, relate it to the idea of keeping a house up to stay in.

Full-Circle Activity (30 minutes)

- Play construction bingo with the students.
- Before beginning to play, go over what each picture means to explain unknown concepts to the students.
- Winner of bingo receives a piece of candy, play two to three rounds to finish off the activity.
    - If candy is not allowed each winner receives a Lego piece. The Legos will be collected throughout the course and on the final day each student will build something with the Legos that they collected.

Total Time: 1 hour 20 minutes

Day Two – Introduction to Construction

Learning Objectives

Students will focus on the different types of building materials that are available. While these materials may not be the typical materials used in actual construction, they are a good introduction for young students.

Materials and Preparation

- Class set of construction paper
- Tape for the class
- Puff paint for the class
- Class set of markers
- Copy of "Who Made This Cake?" by Chihiro
- Class set of construction-themed bingo
- Class set of construction-themed flash cards
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking if anyone remembers what construction means. (to build)
- Whoever can answer confidently and correctly receives praise.
    - May also receive a Lego to be collected throughout the course and used as an activity during the final session.
- Ensure all students understand that construction means to build.
- Introduce flash cards 1-10 as examples of the types of materials used in construction
    - Use the Notes side of the flash card as talking points with the students

Practical Exposure/Snack (20 minutes)

- Explain to the students that we are going to focus on building using different materials.
- Give each student a handful of pretzels, mini marshmallows, and graham cracker pieces. Pretzels represent wood, mini marshmallows represent brick, and graham crackers represent concrete slabs.
- Try building a house with each type of material. Once complete, ask the students:
    - Which material worked best?

    - Which was the strongest material?
    - Which was the easiest material to use?
- Allow students to eat their snack

Story Session (15 minutes)

- Read “Who Made This Cake” by Chihiro, published in 2008.
- After reading, transition into the practical experience activity of making a large cake like the book.

Practical Exposure (20 minutes)

- Construct a large cake with the students in groups of three-four.
- Use construction paper, tape, puffy paint, and markers. Give students the task of making the cake look like the cake made in the book.
- After the activity, reinforce everyone knows what construction means.

Full-Circle Activity (15 minutes)

- Play construction bingo with the students.
- Winner of bingo receives a piece of candy or Lego, play two to three rounds to finish off the activity.

Total Time: 1 hours 20 minutes

Week Two Lesson Plan

Day One – Demolition

Learning Objectives

Students will learn about their first form, or often the first step within the construction process – demolition.

Materials and Preparation

- Class set of Lego block towers
- Copy of "Demolition" by Sally Sutton
- Class set of a small bag of Legos and a bouncy ball for students to take home
- 4 sets of "Demolition Lab – Wrecking Ball" game
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (5 minutes)

- Start the unit by introducing the word 'demolition' and its following simplified definition, 'to tear down'. Before giving the definition, ask if any of the students know what demolition means.
- Explain that demolition is the opposite of construction. Ask the students if they remember the definition of construction, and why the two are opposites.
- Have the students repeat both halves of the definition a few times to gauge their comfort level with the concept.

Practical Exposure (10 minutes)

- Give students stacks of Lego blocks, approximately 10 blocks in a stack.
- Ask students to take out their erasers from their pencil cases and attempt to knock the stack down/apart only by hitting it with the eraser. In this example, the eraser is functioning as a wrecking ball.
- Once finished, show students a short clip of how a wrecking ball takes down a building
    - "Wrecking Ball Demolition" on YouTube (2:07)

Story Session (15 minutes)

- Read "Demolition" by Sally Sutton, published in 2012.
- Once the book is complete, ask if any of the students remember the definition for demolition.

Snack (10 minutes)

- Provide 4 squares of graham crackers and a bouncy ball per student.
- Have students stack the graham crackers to build a box (leaning the sides together to make it stand).

- Explain while building the box that the box represents a house, relate it to the idea of building a house reminding the students of the definition of construction.
- Next, have the students gently toss the bouncy ball toward the graham cracker structure. Remind the students that the bouncy ball is like the wrecking ball that they saw in the YouTube video.
- Have the students eat their graham crackers while discussing the concept of demolition, reminding them of the definition

Full-Circle Activity (20 minutes)

- Play construction bingo with the students.
- Before beginning to play, review what each picture means by asking who remembers what each picture means. Give praise to correct answers and assist with filling in the gaps to define each picture and how it applies to construction.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.
- Winner of bingo receives a piece of candy or Lego, play two to three rounds to finish off the activity.

Total Time: 1 hour

Day Two – Introduction to Safety

Learning Objectives

Students will focus on the need for safety throughout the construction process. They will learn not only the importance of safety first; but also tools and techniques that are standard in the construction industry.

Materials and Preparation

- Class set of yellow construction paper
- Tape for the class
- Large sheets of paper (48 X36 inches)
- Class set of markers
- Safety vest
- Copy of "Goodnight, Goodnight, Construction Site" by Sherri Duskey Rinker
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to be given out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Introduce the concept of safety, and what it means to be safe.
- Ask students how they are safe at home or in class, and explain the importance of it.
- Allow students to discuss ways to be safer in the classroom.

Practical Exposure (20 minutes)

- Give each student a piece of yellow construction paper and have them take out their scissors and markers from their pencil boxes.
- Explain that yellow is a safe color because it is easy to see people when you are working. Also explain that they are going to cut out a safety vest.
- Allow students to cut out the vest, and show them an example of a real life vest to try on.

Story Session (15 minutes)

- Read "Goodnight, Goodnight, Construction Site" by Sherri Duskey Rinker published April of 2011
- Ask students if they can name any of the machines that were in the book, anyone who can receives praise.
    - May also receive a Lego to be collected throughout the course and used as an activity during the final session.

Snack (10 minutes)

- Give students 3 small pieces of celery, some peanut butter, and 3 of each red, yellow, and green M&Ms.
- Explain to the students that they are making stop lights. Stop lights are important because they keep drivers safe so they don't hurt each other.
- Allow students to create their stop lights and enjoy snack

Full-Circle Activity (25 minutes)

- Play construction bingo with the students.
- Winner of bingo receives a piece of candy or Lego, play two to three rounds to finish off the activity.

Total Time: 1 hours 20 minutes

Week Three Lesson Plan

Day One – The Importance of Safety

Learning Objectives

Students will continue their education in the importance of safety, and learn more about what construction workers were on their site each day.

Materials and Preparation

- Steel-toed boots
- Hardhat
- Safety glasses
- Safety vest
- Copy of "Be Careful and Stay Safe" by Cheri J Meiners
- Class set of miniature hardhat stress balls
- Class set of draw-by-number Bob the Builders (see link at end of lesson plan)
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the class in full gear, ask students if any of them remember what the safety vest is called.
- Once a student has identified it, ask if anyone in the class knows what else you are wearing that makes you safe.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.
- Explain each item and how it keeps you safe, ask students to come up with examples of how you could possibly get hurt.

Practical Exposure (10 minutes)

- Have students challenge their counting and dexterity by completing a draw by number picture of Bob the Builder.
- While students are working, explain that Bob the Builder is always safe, as they should be. Ask them what colors are considered 'safe' (yellow and orange). Whoever gets them right gets praise.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Story Session (15 minutes)

- Read "Be Careful and Stay Safe" by Cheri J Meiners to students.

- Ask once again how they are safe every day, and what you as a teacher can do to stay safe.

Snack (10 minutes)

- Have students create "safety cones" with orange icing and sugar cones.
- Each student will spread the orange icing on the cones, creating a safety cone. After, allow them to enjoy snack.

Full-Circle Activity (25 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 hours 10 minutes

Bob the builder coloring page: http://www.bobthebuilder.com/en-us/Images/1894_BTB_Website_Activity_Sheets_v5%208_tcm1239-232752.pdf

Day Two – Tools & How We Use Them

Learning Objectives

Students will learn about a handful of different tools, what they are called, and how to use them safely.

Materials and Preparation

- Copy of "Tip Tip, Dig Dig" by Emma Garcia
- Large bundle of craft sticks
- Class set of mash & mold playsand
- Large container of beads, container of buttons
- Box of noodles
- Large spool of yarn
- Box of paper clips
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by explaining to students that construction workers use tools to be able to build.
- Introduce and review flash cards 11-20 from the construction-themed flash card deck.

- If possible, show students various examples of real hammers, screw drivers, etc.

Practical Exposure (25 minutes)

- Give each student 3 craft sticks and a handful of the remaining materials (beads, buttons, noodles, yarn, paper clips).
- Each student also gets a small can of mash and mold sand.
- Using the bob the builder blueprints at the end of this lesson plan, have students create different tools and see what patterns they leave in the playsand. Explain that these tools are like real tools because they leave marks in the sand, and ask students to name their tools.
- Allow students to take home the playsand and the tools they created.

Story Session (15 minutes)

- Read "Tip Tip, Dig Dig" by Emma Garcia
- Ask students if they saw any tools in the book and if they remember the name of said tool.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Snack (10 minutes)

- Have students create edible construction trucks.
- Give each student 1 and a half vanilla wafer cookies, 1 full cookie and the half cut into 2 pieces. Have them stack the three cookies to look like a truck, and give them 4 mini rolos to put on the sides for the wheels.
- Allow students to eat snack

Full-Circle Activity (20 minutes)

- Ask students to name all machines/tools on the bingo cards.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 hours 20 minutes

Bob the builder: http://www.bobthebuilder.com/en-us/Content/ASSETS/Images/020Activities/050Blueprints/PDFs/BTB_Blueprint_06_MM_TOOLS_Digital_US.pdf

Week Four Lesson Plan

Day One – Dirt/Civil Workers (Excavator)

Learning Objectives

Students will learn what a dirt worker/civil worker (excavator) is and what tools they use to perform their job.

Materials and Preparation

- Individual copies of "Build a Digger" for students to use in class and take home
- Yellow and black construction paper
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the class by asking if anyone knows what a dump truck is, or who uses it. Explain that dump trucks are used to move dirt, and the men who drive them are sometimes called dirt workers or excavators.
- Review Flashcards 6, 17, 19, and 30, using the instructor notes on the back of the cards.
- Explain the process of removing dirt from a job site, and ask students if they had ever seen dirt get taken away in that manner

Practical Exposure (10 minutes)

- Have students create their own dump truck with the yellow and black construction paper.
- Students will use their own scissors and glue from their pencil pouches, and can color on the page with their markers if they wish.
- Give minimal instructions and allow the kids to really think about how a dump truck works

Story Session (30 minutes)

- Read "Build a Digger" to the students, allow them time to create one of the models. The other three are for take-home or later use.

Snack (10 minutes)

- Have students create dirt in a cup.
- With chocolate pudding, sprinkle on Oreos for the top dirt and give each student 1-2 gummy worms.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.

- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 minutes

Day Two – Who are Dirt/Civil Workers (Excavators)?

Learning Objectives

Students will learn more about dirt/civil workers (excavators) including a visit from a guest speaker, in order to gain more appreciation for the trade.

Materials and Preparation

- Class set of miniature dump trucks and mold and mash sand
- Access to YouTube Video (refer to link at end of lesson plan)
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking the students if anyone remembers what a dump truck is used for during construction.
- Also ask if students remember who runs a dump truck, and what they are called
- Review Flashcards 6, 17, 19, and 30, using the instructor notes on the back of the cards.
- Show class YouTube Video https://www.youtube.com/watch?v=MXhhXXsxSfE

Practical Exposure (20 minutes)

- Give each student a dump truck and a decent amount of play sand and help them understand what dump trucks do as they use the sand to load and unload the dump truck.
- Make a game out of it – have them see who can move all the play sand from one side of their desk to the other only using the dump truck's bed. Winner gets either a piece of candy or a Lego block to use at the end of the sessions.

Story Session (30 minutes)

- Instead of a story, bring in a guest speaker who works in the industry to talk about what they do on a daily basis. Encourage students to ask questions and get engaged.

Snack (10 minutes)

- Have students create edible 'rocks'.

- Mix together crushed pretzels, M&Ms, and other small pieces of food to create gravel.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a dirt/civil worker. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 hour 30 minutes

YouTube Video: https://www.youtube.com/watch?v=MXhhXXsxSfE

Week Five Lesson Plan

Day One – Concrete Workers

Learning Objectives

Students will learn what someone in the concrete industry does and what tools they use to perform their job.

Materials and Preparation

- Sets of make-your-own stepping stone, one per student
- Copy of "The Mixed-Up Truck" by Stephen Savage
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the class by asking if anyone knows what a concrete truck is, or who uses it. Explain that concrete trucks mix the concrete inside, a slushy hot mixture that makes us able to have buildings.
- Review Flashcards 3, 13, 26, and 40-50, using the instructor notes on the back of the cards. Skim over Flashcards 40-50 noting that concrete is used as the base, walls and sometimes to make things more stable, in almost every type of building.
- Explain the process of pouring concrete, how much effort goes into it, and how many people are involved in the process to make a building with concrete.

Practical Exposure (25 minutes)

- Have students create their own stepping stone using the kits.
- Students will mix their own cement/concrete, pour it into a mold, and decorate it accordingly. Help students through the process of mixing the cement as that can be difficult, but give them a chance to figure out how it should go.

Story Session (15 minutes)

- Read "The Mixed-Up Truck" by Stephen Savage, ask students if they can point out the concrete truck, pump, etc to get more of a gauge on their understanding.

Snack (10 minutes)

- Have students create their own 'concrete' using a small amount of icing and crushed up graham crackers. Give them more full-sized crackers to dip in their treat.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.

- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – Who are Concrete Workers?

Learning Objectives

Students will learn more about workers in the concrete industry including a visit from a guest speaker, in order to gain more appreciation for the trade.

Materials and Preparation

- Class set of rubber concrete trucks for students to take home.
- Popsicle sticks
- Small tub of glue
- "Frames" for students to make "concrete floors" in. Essentially a 6"x6" cardboard box
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking the students if anyone remembers what a concrete truck is used for during construction.
- Also ask if students remember who runs a concrete truck, and what they are called
- Review Flashcards 3, 13, 26, and 40-50, using the instructor notes on the back of the cards. Skim over Flashcards 40-50 noting that concrete is used as the base, walls and sometimes to make things more stable, in almost every type of building.
- Show class YouTube Video (33 seconds) https://www.youtube.com/watch?v=tMK6IxxcTpM

Practical Exposure (20 minutes)

- Give each student a handful of Popsicle sticks and a small container of liquid glue, along with their frame.
- Have students lay down the Popsicle sticks in the frame and then pour the glue on top, similar to how reinforcing and concrete work together. Also give them the small rubber concrete truck but ensure they don't put it in the glue.

Story Session (30 minutes)

- Instead of a story, bring in a guest speaker who works in the industry to talk about what they do on a daily basis. Encourage students to ask questions and get engaged.

Snack (10 minutes)

- Give each student a Dixie cup, a Popsicle stick, and some Jell-O along with some finely chopped fruit for filling.
- Have students mix everything together, rotating the cup how a concrete truck rotates.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a concrete worker. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

YouTube Video: https://www.youtube.com/watch?v=tMK6IxxcTpM

Week Six Lesson Plan

Day One – Crane Operators

Learning Objectives

Students will learn how a crane operator works, and what they do day to day on the job.

Materials and Preparation

- Miniature operable tower crane to demonstrate how a tower crane works.
- Miniature operable crawler crane to demonstrate how a crawler works.
- "What Can A Crane Pick Up?" by Rebecca Dotlich
- Truck Crane video (https://www.youtube.com/watch?v=bLfov3RhNhw)
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the class by asking if anyone knows what a crane is, or if anyone knows why there are different types of cranes.
- Review Flashcards 16, 18, 20, 25, and 42-47 & 50, using the instructor notes on the back of the cards. Skim over Flashcards 44-47 & 50 noting that cranes are used for bigger building and tall buildings. Stress Flashcards 16 and 20 as Safety is necessary for every job, but especially when using cranes.
- Explain that cranes are used for a variety of reasons, but they are typically used to pick up heavy equipment or material and move it to the building.

Practical Exposure (20 minutes)

- Have students take turns operating the two miniature model cranes. The tower crane can easily pick up a bottle of hand sanitizer if set up correctly, and the crawler crane model should be able to do similar.
- Watch Truck Crane video (https://www.youtube.com/watch?v=bLfov3RhNhw)

Story Session (15 minutes)

- Read "What Can A Crane Pick Up?" to the class and allow them to attempt to name what materials the crane is picking up and setting down.
- Give a small treat to the students who can correctly name materials that have been discussed in class already.

Snack (10 minutes)

- Have students create a 'safety cone' with a wheat thin, hummus, and a baby carrot. Give students 2-3 of each item for a more fulfilling snack.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 15 Minutes

Day Two – Who are Crane Operators?

Learning Objectives

Students will learn more about crane operators including a visit from a guest speaker, in order to gain more appreciation for the trade.

Materials and Preparation

- "Crane and Crane" by Linda Joy Singleton
- Miniature model of a tower crane
- Miniature model of a crawler crane
- Small toy truck cranes for students to take home
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking the students if anyone remembers what a crane typically lifts.
- Also ask if students remember who runs a crane, and what they are called.
- Review Flashcards 16, 18, 20, 25, and 42-47 & 50, using the instructor notes on the back of the cards. Skim over Flashcards 44-47 & 50 noting that cranes are used for bigger building and tall buildings. Stress Flashcards 16 and 20 as Safety is necessary for every job, but especially when using cranes.

Practical Exposure (20 minutes)

- Give each student another go at operating the two model cranes. Again, both should be able to lift a regular sized hand sanitizer bottle.

Story Session (20 minutes)

- Read "Crane and Crane" to the students, and follow up by having a crane operator explain what they do on a day-to-day basis.

Snack (10 minutes)

- Allow students to bring their own snack today.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a crane operator. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Week Seven Lesson Plan

Day One – Framing

Learning Objectives

Students will learn what framing is, how to frame a house, and the importance of framing.

Materials and Preparation

- Popsicle sticks for the class
- Enough glue for the class
- Cardboard pieces for the class
- "Digger, Dozer, Dumper" by Hope Vestergaard
- Class set of construction-themed bingo
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin class by asking if anyone knows how a house is made. Explain that it is framed, and what framing is.
    - Give a small reward to any student who could correctly answer.
- Review Flashcards 1, 2, 9, 11, 12, 27and 41-47, using the instructor notes on the back of the cards. Skim over Flashcards 41-47 noting that all of these types of buildings need to be framed.

Practical Exposure (20 minutes)

- Have students make their own house. Give each student a piece of cardboard, a good handful of popsicle sticks, and a small pot of glue. Teach them how to get the flat end of the popsicle stick to serve as the base of the house and build up.
- Once constructed, let students set their houses aside to dry.

Story Session (20 minutes)

- Read "Digger, Dozer, Dumper" by Hope Vestergaard to the students.
- Ask students if they can name each of the machines shown in the book. This is good practice for memorization and identification.

Snack (10 minutes)

- Give students a handful of pretzels and some peanut butter. Ask them to construct some form of structure using the new framing skill they're learning about today.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.

- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – What do Framers do?

Learning Objectives

Students will learn more about framers including what materials they use, what they do, and how they benefit a building.

Materials and Preparation

- Photo frame kit for each student
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking the students if anyone remembers what framing is, and what a framer does.
    - Reward students with a small prize if they remember.

Practical Exposure (20 minutes)

- Have each student make a picture frame using the photo frame kit. They will take a picture with the guest speaker to hang in it.

Story Session (30 minutes)

- Instead of reading a story, have a guest speaker come in to speak about what they do day-to-day and what tools they work with.

Snack (10 minutes)

- Give students a handful of grapes and a good bunch of dull toothpicks. Have them 'frame a wall' using the grapes as glue.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a crane operator. Give them time to think it over, and praise those who can point to appropriate items.
    - Students should be able to pick out Flashcards 1, 2, 9, 11, 12, 27and 41-47. Reinforce that Flashcards 41-47 are types of buildings that need to be framed.
    - *Optional – Give students a Lego for appropriate responses.

- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 30 Minutes

Week Eight Lesson Plan

Day One – Drywall

Learning Objectives

Students will learn the importance of having drywall and how to keep it safe along with tying back to framing and how the two operate together.

Materials and Preparation

- Small pieces of drywall for the students to examine and be able to take home.
- A small piece of cardboard per student, along with Popsicle sticks and glue to build out their own wall.
- YouTube video explaining how to patch drywall: https://www.youtube.com/watch?v=qvtoikKG318
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Building off of the previous week, begin by asking if anyone remembers what framing is.
    - Explain that drywall uses framing to stay upright, and give the students the time to understand the concept.
- Review Flashcards 11, 12, 27, 37 and 41-47, using the instructor notes on the back of the cards. Skim over Flashcards 41-47 noting that all of these types of building need to be drywalled.

Practical Exposure (25 minutes)

- Have students build out their own wall. With adult supervision, help them glue a small piece of cardboard to two Popsicle sticks standing upright. This mimics studs (the Popsicle sticks) and drywall (the cardboard).
    - If there's an excess of time, allow students to carefully paint or draw on the cardboard symbolizing paint or wallpaper.

Story Session (20 minutes)

- As opposed to reading a story, take this time to ask students if they have any questions about what happens to drywall if it breaks. After the guided discussion, show students a YouTube video on how to patch a drywall hole.
- https://www.youtube.com/watch?v=qvtoikKG318

Snack (10 minutes)

- Give students a handful of wheat thins and pretzels along with a scoop of hummus.

- Have students create another built out wall using these materials, and then let them enjoy snack.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 25 Minutes

Day Two – Who Builds With Drywall?

Learning Objectives

Students will learn who uses drywall and the different types available for different uses.

Materials and Preparation

- Larger pieces of drywall in various forms (typical, water-resistant, fire-retardant) to test how drywall differs depending on what use it is needed for.
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking students if they remember what drywall is.
    - Lead the discussion to talk about building walls out with framing, and see if the students can remember the two correlate.
- Review Flashcards 11, 12, 27, 37 and 41-47, using the instructor notes on the back of the cards. Skim over Flashcards 41-47 noting that all of these types of building need to be drywalled.

Practical Exposure (20 minutes)

- Using the three large pieces of drywall supplied, allow students to knock on and feel each type of drywall to see if there are any differences.
- Have students write down as many similarities and differences between the three types of drywall as possible.

Story Session (30 minutes)

- As opposed to a story or video, have a carpenter come in to talk about drywall and what he/she does in a day's work. Allow students to ask questions, and reward those who speak up and stay engaged.

Snack (10 minutes)

- Allow students to bring their own snack, specifying that if possible they should be able to build something with it. This will allow your students to get creative and see what they can make at home.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a drywaller. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 30 Minutes

Week Nine Lesson Plan

Day One – Roofer

Learning Objectives

Learn what roofing consists of, the dangers around it, and how to stay safe.

Materials and Preparation

- YouTube video to make an origami roof: https://www.youtube.com/watch?v=i7uB9lm-si8
- YouTube video showing how roofing is done: https://www.youtube.com/watch?v=ZXbZwvRhSG8
- Multicolored construction paper
- Class set of scissors
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Ask students if any of them remember what type of construction a house is considered (residential). Allow them to take time to deliberate, and follow up by asking what is at the top of a house.
    - Try to get across that roofs are what keep the students safe in their houses, and even at the school.
- Review Flashcards 7, 10, 11, 12 and 41-47, using the instructor notes on the back of the cards. Skim over Flashcards 41-47 noting that all of these types of building have a roof.

Practical Exposure (20 minutes)

- Play origami roof video for the students three or four times, allowing it to quietly run on the screen while they attempt their own origami roof.
    - Give students 2-3 pieces of construction paper each to allow for multiple attempts.
    - https://www.youtube.com/watch?v=i7uB9lm-si8

Story Session (20 minutes)

- As opposed to reading a story, show students the following video talking about roofing. Ask discussion questions including what type of machinery is used, if they would be willing to work on a roof, and if they had ever seen this in real life.
- https://www.youtube.com/watch?v=ZXbZwvRhSG8

Snack (10 minutes)

- Give students a paper plate, a scoop of chocolate icing, and a couple thin mint cookies.

- Allow them to shingle their paper plate using the icing as glue before enjoying snack.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – Who are Roofers?

Learning Objectives

Students will have the opportunity to speak with a roofer, and learn what he/she does on a day to day basis.

Materials and Preparation

- YouTube video to make an origami house: https://www.youtube.com/watch?v=8c3bJi2AUIU
- Multicolored pack of construction paper
- Class set of scissors
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Start by asking students if they remember what roofing is, and what materials are used.
    - Give students who can correctly answer a prize, but praise all attempts. Roofing materials are not easy to remember.

Practical Exposure (20 minutes)

- Play the origami house YouTube video 2-3 times before allowing it to run quietly in the background. Give students 3-4 pieces of paper to allow for numerous attempts, and help create the houses as needed.
    - https://www.youtube.com/watch?v=8c3bJi2AUIU

Story Session (30 minutes)

- As opposed to a story or video, have a roofer come in to talk about what he/she does in a day's work. Encourage students to ask numerous questions, and give small prizes to the students who ask well thought out questions about his/her trade.

Snack (10 minutes)

- Allow the roofer to provide snack, staying away from peanut allergies and/or bringing alternatives to wheat and other top 8 allergies as needed.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a roofer. Give them time to think it over, and praise those who can point to appropriate items.
    - Students should identify Flashcards 7, 10, 11, 12 and 41-47. Reinforce that Flashcards 41-47 all have a roof.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 30 Minutes

Week Ten Lesson Plan

Day One – Plumber

Learning Objectives

Students will learn about the important of plumbing and what is involved in it.

Materials and Preparation

- Class set of plumbing word search: https://s3-us-west-1.amazonaws.com/faithnetworkuserfilestore/FAITHNETWORK_USERFILESTORE/FAITHNETWORK_USERFILESTORE/filecabinet/ministries/5cab3db0-b143-4543-8c38-2e5eb1215921/Word%20Search%20Puzzle.pdf
- 10 feet of ½ PVC pipe
- Handful of connectors for PVC pipe
- Pipe cutters to cut pipe into various lengths
- Kiddie pool
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the discussion by having students explain what they know about plumbing already. Give them time to think about what requires plumbing (bath, toilet, sink, etc.)
- d

Practical Exposure (25 minutes)

- Have students wrap their heads around how water works. Using the PVC pipe cut into multiple different pieces, the fittings, and the kiddie pool filled with water, give students time to play with the pipes and understand key concepts of plumbing.

Story Session (20 minutes)

- As opposed to a story or video, allow students to read on their own while completing a plumbing crossword puzzle.
    - https://s3-us-west-1.amazonaws.com/faithnetworkuserfilestore/FAITHNETWORK_USERFILESTORE/FAITHNETWORK_USERFILESTORE/filecabinet/ministries/5cab3db0-b143-4543-8c38-2e5eb1215921/Word%20Search%20Puzzle.pdf

Snack (10 minutes)

- Provide push pops for each student. Explain that pushing the pop up out of the wrapper is similar to the idea of water being forced out of a pipe.

Full-Circle Activity (15 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 minutes

Day Two – What Do Plumbers Do?

Learning Objectives

Students will learn what plumbers do in more technical terms, and have another chance at playing in the PVC kiddie pool.

Materials and Preparation

- YouTube video explaining how water gets to the tap: https://www.youtube.com/watch?v=_AXtsOYnlXM
- 10 feet of ½ PVC pipe
- Handful of connectors for PVC pipe
- Pipe cutters to cut pipe into various lengths
- Kiddie pool
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by playing a short YouTube video explaining how water gets to the tap.
    - https://www.youtube.com/watch?v=_AXtsOYnlXM
- Review Flashcards 11, 12, 14, 23, 31, 32, 34 and 40-47 & 49, using the instructor notes on the back of the cards. Skim over Flashcards 40-47 & 49 noting that all of these types of buildings require a plumber.

Practical Exposure (20 minutes)

- Allow students a shorter period of time to play in the PVC kiddie pool, giving directions on what types of structures to build to see how water flows.

Story Session (30 minutes)

- As opposed to a story or video, have a plumber come in to talk about what he/she does in a day's work. Encourage students to ask numerous questions, and give small prizes to the students who ask well thought out questions about his/her trade.

Snack (10 minutes)

- Provide blue Jell-O and gummy fish to put in the Jell-O. The Jell-O signifies water, which the students have spoken about the previous two days.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a plumber. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 hour 30 minutes

Week Eleven Lesson Plan

Day One – Electrician

Learning Objectives

Students will learn about the importance of electrical work and what is involved in being an electrician.

Materials and Preparation

- Bundle of wire
- Different types of lightbulb
- Class set of Easter eggs, battery-operated tea lights, sticker googly eyes, sharpies
- Construction paper
- Pipe cleaners
- Glue dots
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the discussion by having students explain what they know about electricity and how it is used every day Give them time to think about what requires electricity (lights, phone charger, fish tank, washer, dryer, etc.)
- Review Flashcards 11, 12, 14, 16, 20, 24, 33, 36 and 39-47 & 49, using the instructor notes on the back of the cards. Skim over Flashcards 36, 39-47 & 49 noting that all of these types of buildings require an electrician.

Practical Exposure (25 minutes)

- Have students wrap their heads around how electric works. Show them the electrical wire, and allow them to pass it around. Also show them how the lights would be wired so that they work, and allow them to carefully pass the bulbs around.

Story Session (20 minutes)

- As opposed to a story or a video, print out directions on how to create light-up fireflies. Give each student time to understand the directions, and create their own firefly. The directions operate as blueprints; incorporating some reading and comprehension skills.
    - https://thedecoratedcookie.com/firefly-craft/

Snack (10 minutes)

- If possible, bring in a popcorn maker for the students. Allow them to plug in the machine, creating an electric current, and explain how the electricity heats the machine up and allows the popcorn to be made. When finished allow students to enjoy their snack.

Full-Circle Activity (15 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – What Do Electricians Do?

Learning Objectives

Students will learn what electricians do in more technical terms, and have another chance at comprehending how lighting and electrical currents work.

Materials and Preparation

- YouTube video as an introduction to electricity: https://www.youtube.com/watch?v=Uf76pThNXZc
- Different types of light bulbs
- Electrical wire
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by playing a short YouTube video that introduces the concept of electricity.
    - https://www.youtube.com/watch?v=Uf76pThNXZc

Practical Exposure (10 minutes)

- Allow students a shorter period of time to carefully play with the light bulbs from the previous class, and let them wire a bulb (without a live current) to see how it works.

Story Session (30 minutes)

- As opposed to a story or video, have an electrician come in to talk about what he/she does in a day's work. Encourage students to ask numerous questions, and give small prizes to the students who ask well thought out questions about his/her trade.

Snack (10 minutes)

- Provide a spin on ants on a log. Give students half of an apple without seeds, peanut butter, and raisins and allow them to make a lighting bug using the peanut butter as the wings and the raisins as the eyes.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by an electrician. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
    - Students should select Flashcards 11, 12, 14, 16, 20, 24, and 33. Reinforce that Flashcards 36, 39-47 & 49 all require an electrician during the build process.
        - Flashcard 39 is associated with an electrician due to streetlights.
- Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Week Twelve Lesson Plan

Day One – Painter

Learning Objectives

Students will learn about what painters do, and the importance of having painters.

Materials and Preparation

- Class set of pieces of siding that are approximately 2”x6”
- A variety of paints for students to choose from
- Class set of sponges
- Class set of “I Ain’t Gonna Paint No More!” by Karen Beaumont for students to be able to take home
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the discussion by having students explain what they know about painters already. Give them time to think about what they have painted before, or what a painter may do in a day.
- Review Flashcards 15, 16, 20, 21, 24, 33, 36 and 39-50, using the instructor notes on the back of the cards. Skim over Flashcards 39-50 noting that all of these types of buildings require a painter.

Practical Exposure (20 minutes)

- Have students paint a piece of siding a color of their choice. This will give them a bit more of an idea of what painters do daily.

Story Session (20 minutes)

- Assist students in reading “I Ain’t Gonna Paint No More!”
    - Each student would receive a copy of the book to take home.

Snack (10 minutes)

- Allow students to bring in a snack that they believe they can ‘paint’. As a back-up, provide crackers and either peanut butter or softened cream cheese for students to spread, and therefore paint, onto their cracker.

Full-Circle Activity (20 minutes)

- Play two to three rounds of bingo with the students.

- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – What Do Painters Do?

Learning Objectives

Students will learn what painters do in more technical terms, and have another chance at painting.

Materials and Preparation

- Class set of canvases that are 5"x7"
- Various paints for students to use
- Paint sponges for students to use
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by asking students if they remember what painters do, and what tools they need to get the job done.
    - Reward students who can correctly answer with a small piece of candy or a Lego toy.

Practical Exposure (20 minutes)

- Allow students to try their hand at painting again, giving them a canvas and 2-3 paints of their choice. Explain that the goal of this painting activity is to make the paint even, and look pretty, much like a painter needs to do.

Story Session (30 minutes)

- As opposed to a story or video, have a painter come in to talk about what he/she does in a day's work. Encourage students to ask numerous questions, and give small prizes to the students who ask well thought out questions about his/her trade.

Snack (10 minutes)

- Create 'paint brushes' using a pretzel stick, a piece of cheese, and some ranch. Stick the piece of cheese on the end of the pretzel stick, and utilize the ranch as 'paint'.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a painter. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
    - Students should identify Flashcards 15, 16, 20, 21, 24, 33, 36. They should also be guided to reflect on the fact that Flashcards 39-50 all require a painter during the build process.
    - Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 30 Minutes

Week Thirteen Lesson Plan

Day One – Landscaper

Learning Objectives

Students will learn about what landscaping is and who does landscaping.

Materials and Preparation

- Zen garden for the class to play with
- Class set of fake bushes/trees/flowers
- Construction paper
- Class set of glue sticks
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the discussion by having students explain what they already know about landscapers. Give them time to think about what where they have seen something that was landscaped. Mention family members mowing the lawn or gardening and explain how that counts as landscaping.
- Review Flashcards 5, 6, 19, 22, 35 and 39-49, using the instructor notes on the back of the cards. Skim over Flashcards 39-49 noting that all of these types of buildings require a landscaper.

Practical Exposure (25 minutes)

- Have students create their own landscape using a piece of construction paper and a handful of fake bushes, trees, and flowers.
    - Explain that they should think about the layout of their landscape to make it look as pretty as possible.

Story Session (20 minutes)

- As opposed to a story, have students watch a YouTube video on landscape architecture and green roofs. As students if they have ever seen a green roof before, or possibly been to a building that had one.
    - https://www.youtube.com/watch?v=RRta4aGJKfc

Snack (10 minutes)

- Bring in broccoli and ranch as a snack. Cut the broccoli to look like bushes and trees, and allow students to create a scene with their snack.

Full-Circle Activity (15 minutes)

- Play two to three rounds of bingo with the students.
- Prior to playing bingo, ask if anyone can name a whole row of pictures. This will count as an unofficial 'bingo', meaning they still get a piece of candy. Reinforce the idea of knowing what the pictures mean.
    - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 20 Minutes

Day Two – What Do Landscapers Do?

Learning Objectives

Students will learn what landscapers do in more technical terms, and have another chance at creating their own landscape.

Materials and Preparation

- Construction paper
- Class set of fake flowers
- Class set of scissors
- Class set of glue sticks
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
- *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by asking students if they remember what landscapers do, and what tools they need to get the job done.
    - Reward students who can correctly answer with a small piece of candy or a Lego toy.

Practical Exposure (20 minutes)

- Allow students to try their hand at landscaping again. Give each student a piece of construction paper and a handful of fake flowers. Allow them to use their scissors and glue sticks to create a scene with their flowers.

Story Session (30 minutes)

- As opposed to a story or video, have a landscaper come in to talk about what he/she does in a day's work. Encourage students to ask numerous questions, and give small prizes to the students who ask well thought out questions about his/her trade.

Snack (10 minutes)

- Allow students to bring in a snack that they think a landscaper would eat. As a secondary measure, provide a pretzel rolls with slits cut into the sides to look like acorns.

Full-Circle Activity (20 minutes)

- Ask students if any of the pictures on the bingo cards would be used by a landscaper. Give them time to think it over, and praise those who can point to appropriate items.
    - *Optional – Give students a Lego for appropriate responses.
    - Students should identify Flascards 5, 6, 19, 22, 35 and 39-49. Reinforce that Flashcards 39-49 are all buildings that require a landscaper.
    - Once complete, play 1-2 rounds of bingo. Winner gets a piece of candy.
        - Correct responses may also receive a Lego to be collected throughout the course and used as an activity during the final session.

Total Time: 1 Hour 30 Minutes

Week Fourteen Lesson Plan

Day One – Teamwork

Learning Objectives

Students will learn about the importance of teamwork in construction and how important it is to work on teams.

Materials and Preparation

- Miniature marshmallows
- Toothpicks
- Plastic eggs (Easter type that open)
- Class set of Crayons (3-4 boxes)
- Access to https://www.youtube.com/watch?v=pJVjLGLaGHA (Teamwork Clip)
- Access to https://www.youtube.com/watch?v=RFfidrnGMIg (Meet the Team)
- Access to https://www.youtube.com/watch?v=Gd-8ztDtfvM (We are a Team)
- Download all 12 coloring pages from http://www.bobthebuilder.com/en-us/activities/coloring
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
    - *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin the discussion by having students explain what a team is and give examples of where they have been on a team.
- Watch the video https://www.youtube.com/watch?v=pJVjLGLaGHA to introduce them to the Bob the Builder Team

Practical Exposure (15 minutes)

- Divide students into groups of equal numbers. Pass out an equal number of marshmallows and wooden toothpicks to each group. Challenge the groups to create the tallest, largest, or most creative structure in a set amount of time, each member taking turns doing the actual building. Afterward, have each group describe what they made.

Story Session (15 minutes)

- As opposed to a story, have students watch the two YouTube videos giving more background and further introducing the Bob the Builder Team. After each video discuss the team members and how they fit into what they have learned throughout the semester. Have students identify which Flashcards from the set align with the Bob the Builder Team.

  https://www.youtube.com/watch?v=RFfidrnGMIg

https://www.youtube.com/watch?v=Gd-8ztDtfvM

Snack (15 minutes)

- Bring in plastic eggs (Easter type) and fill them with various mini candy bars (or select a healthier choice that will fit in your selected size plastic egg). Hide the eggs throughout the classroom. Have the students search for the eggs as a team, making sure that there is an egg for each student by the end of the activity. Allow the students to enjoy eating the contents of their egg.

Full-Circle Activity (25 minutes)

- Download the coloring pages for all of the members of Bob the Builder's Team http://www.bobthebuilder.com/en-us/activities/coloring (there are a total of 12). Make certain that you have enough coloring sheets for each student to have one. Distribute one coloring page to each student. Divide the class into 3-4 "teams", with each team sharing one box of crayons.
- Have the students color their assigned Bob the Builder Team member
- Have one student from each team show the class the completed pictures from their team.
- Post the pictures around the room

Total Time: 1 Hour 20 Minutes

Day Two – How Do Teams work in Construction

Learning Objectives

Students will learn how teams come together and what how they work in a Construction environment.

Materials and Preparation

- Shoeboxes – one smaller than the other (3-5 sets)
- Class Scissors (3-5)
- Construction paper
- Class Tape
- Class Glue
- Three Cheers for Kid McGear! (Construction Book by Sherri Duskey Rinker and AG Ford | Sept 24, 2019)
- Class set of Art Supplies (e.g. paint, crayons, stickers, etc.)
- Access to https://www.youtube.com/watch?v=fp_gauD9EQ0 (Meet the Team)
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
    - *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by asking students if they remember the importance of teamwork and ask what teams they have been a part of recently or have watched (e.g. sports teams).
    - Reward students who can correctly answer with a small piece of candy or a Lego toy.

Practical Exposure (15 minutes)

- Watch the video https://www.youtube.com/watch?v=fp_gauD9EQ0 (Meet the Team). Review how each member of Bob the Builder Team relates to those in the Flashcards.

Story Session (25 minutes)

- Read the book Three Cheers for Kid McGear! (Construction Book by Sherri Duskey Rinker and AG Ford | Sept 24, 2019)
    - Discuss the teamwork in the book

Snack (10 minutes)

- Allow students to bring in a small snack to share with 3-5 classmates. Divide the class into teams and have them share their snacks (trading and sharing with those within their team).

Full-Circle Activity (30 minutes)

- Divide the students into 3-4 teams (4-5 team members per team)
- Instruct each team to work together to build a Shoebox house. Supervise all teams and they determine who will do which activities in the process. Describe the following process to the entire class and then give them defined time limits for each step. Explain that the process is like a blueprint for building in Construction. Encourage each team to work together, take turns and make certain that everyone participates.
    - Tape or glue construction paper around the shoeboxes.
    - Cut doors, windows, and other household props from the lids of the shoeboxes.
    - Instruct students to decorate the outside and inside of the house using the art supplies. Remind your students that the larger shoebox will be the bottom floor, while the smaller one will be the top floor.
    - Finally, glue the smaller shoebox on top of the larger shoebox.
    - Have one member of each team show the class their Shoebox house and explain the details.

Total Time: 1 Hour 30 Minutes

Week Fifteen Lesson Plan

Day One – Bringing it all Together

Learning Objectives

Students will review what they have learned during the semester about the construction industry and the various roles that make up construction teams

Materials and Preparation

- Workman's Tools (screwdrivers, hammers, nails, screws, wrenches)
  - One of each for 3-4 teams
- Construction Hat (3-4)
- Tool belt (3-4)
- Yellow cheese slices
- Black Olives
- Plastic knifes
- Access to https://www.youtube.com/watch?v=YBhJ8O7p2j8 (Let's Build a House)
- Let's Build a House book by Mick Manning
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
  - *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (15 minutes)

- Begin the discussion by having students review Flashcards 40-50, emphasizing all of the different types of buildings that require construction teams.
- Watch the video https://www.youtube.com/watch?v=YBhJ8O7p2j8 to reinforce all of the various components that go into building a house. Discuss which Flashcards are reflected in the video.

Practical Exposure (15 minutes)

- Ask the students to reflect on the video that they just watched and to name which tools might be used and what type of worker would be involved for each component of the house as it was built: (use the Flashcards as aids to help them remember the components)
  - Roof
  - Door
  - Windows
  - Chimney (assume it is brick)
  - Walls
  - Landscaping
- Build piles with the Flashcards for each component. When a Flashcard is needed for more than one component, comment on the importance of that person or tool.

Story Session (20 minutes)

- Read the book “Let’s Build a House” by Mick Manning
    - The book gives students the opportunity to fill in missing words. Distribute candy (or lego piece) to students for a correct response.

Snack (10 minutes)

- Provide slices of yellow cheese and black olives for the class. Have students use a plastic knife and cut the cheese into the shape of a safety cone.
- Use the black olive as the base to the cone.
- Discuss the need for safety in everything they do.
- Allow students to eat the cheese and olives.

Full-Circle Activity (20 minutes)

- Split the students into teams and line them up at one end of the classroom. At the other end of the classroom have a box of tools (have enough tools as there are the number of players) and workmen's hat placed next to the box.
- Nominate one person in each team to be 'Builder Bob' and give him/her a tool belt to wear.
- On the start whistle/call, the first team member must rush to the tool box, grab a tool, run back to their team and place it in Builder Bob's tool belt. Then the next team member goes. Once Builder Bob has a full tool belt, they must race to grab the workman's hat and place it on their head.
- The first Builder Bob to put the hat on is the winning team.

Total Time: 1 Hour 20 Minutes

<u>Day Two – What to be when I Grow Up</u>

Learning Objectives

Students will learn identify with various roles that they might consider when they grow up and understand what that role might entail on a daily basis.

Materials and Preparation

- Class set of Legos
- Pretzel Logs (enough for 3-5 teams to build a log structure)
- Look at That Building!: A First Book of Structures (Exploring Our Community) Hardcover
- Class set of construction-themed flash cards (printed on card stock, folded in half and glued or taped, picture side to show students, Notes side to be used as instructor talking points)
    - *Optional – set of Legos to give out with praise and for prizes during the games. To be collected by each student during each class and utilized during an activity in the final session.

Introduction (10 minutes)

- Begin by asking students if they remember the various roles that are required in the Construction industry. Use flashcards (21 – 30) to review the various roles.
    - Reward students who can correctly answer with a small piece of candy or a Lego toy.
- Have the students vote on which roles they may wish to consider when they grow up.

Practical Exposure (15 minutes)

- Have the students divide into groups so that each role on Flashcards 21-30 has at least one student assigned to the role. Try to align the students based on their selections in the previous activity; however, encourage them to cover all of the roles
- Based on their role, have the students select which Flashcards they would use on a daily basis from:
    - Materials (Flashcards 1-10)
    - Tools (Flashcards 11-20)
    - Items/Components (Flashcards 31-40)
    - What their role would help build (Flashcards 41-50)
- Point out to the students that there are lots of potential opportunities and many tools/components are used by several roles.

Story Session (25 minutes)

- Read Look at That Building!: A First Book of Structures (Exploring Our Community) Hardcover – September 1, 2011 by Scot Ritchie

    - Discuss how the book mirrors everything we have been learning throughout the semester.

Snack (10 minutes)

- Divide the students into 3-5 groups.
- Distribute pretzel logs (20-24 logs per group).
- Instruct the students to build a structure by laying the pretzels out:
    - 4 across the bottom (spaced about 2 inches apart)
    - 4 perpendicular across the bottom layer (spaced about 2 inches apart)
    - 4 the same direction as the bottom layer (spaced about 2 inches apart)
    - 4 perpendicular to the previous layer (spaced about 2 inches apart)
- Allow the students to snack on their building.

Full-Circle Activity (30 minutes)

- Divide the students into 2-4 teams (5-6 team members per team)
- Have each team assign roles:
    - Carpenter
    - Roofer
    - Painter
    - Plumber

    - Electrician
    - Landscaper (if enough students)
- Distribute Legos to each team
    - If Legos were used as prizes throughout the semester, these can be used for their buildings during this activity
- Instruct each team to work together to build a Lego building, role-playing who would do what during the process. All students would build with the legos and they would role-play having the painter paint, the plumber install the toilets, sinks, baths, etc., and the electrician wiring and making the lights work.
- Supervise all teams as they role-play and help them understand the importance of each role.
- After all teams are completed, have them describe their building and have each role describe how they contributed.
    - Have the carpenters explain what the building is and the design process
    - Have the roofers explain what type of roof it has and why it was selected
    - Have the painters explain what colors they painted for each room and the outside of the house
    - Have the plumbers explain what they installed and why it is important
    - Have the electricians explain what they did and why it is important
    - Have the landscapers explain what they used for the outside of the building and how it adds value to the design

Total Time: 1 Hour 30 Minutes

Works Cited

Beaumont, Karen, and David Catrow. *I Ain't Gonna Paint No More!* Houghton Mifflin Harcourt, 2019.

Bob the Builder US. "Bob the Builder: Meet the Team // Bob." *YouTube*, YouTube, 2016, https://www.youtube.com/watch?v=RFfidrnGMIg.

Bob the Builder US. "Bob the Builder: Sing-a-long Music Video // We Are a Team (Everybody Shout High Five)." *YouTube*, YouTube, 2016, https://www.youtube.com/watch?v=Gd-8ztDtfvM.

Chapman, Keith, and Hit Entertainment Limited. "*Beyond Playtime, into Real Time | Bob the Builder.*" Beyond Playtime, into Real Time | Bob the Builder, 2015, www.bobthebuilder.com/en-us/Images/1894_BTB_Website_Activity_Sheets_v5%208_tcm1239-232752.pdf.

Chapman, Keith, and Hit Entertainment Limited. "*BEYOND PLAYTIME, INTO REAL TIME."* Beyond Playtime, Into Real Time | Bob the Builder, 2018, www.bobthebuilder.com/en-us/activities/coloring.

Discovery Education. "*Plumbing word search."* Plumbing word search, n.d., https://s3-us-west-1.amazonaws.com/faithnetworkuserfilestore/FAITHNETWORK_USERFILESTORE/FAITHNETWORK_USERFILESTORE/filecabinet/ministries/5cab3db0-b143-4543-8c38-2e5eb1215921/Word%20Search%20Puzzle.pdf

Dotlich, Rebecca Kai, and Mike Lowery. *What Can a Crane Pick up?* Alfred A. Knopf, 2014.

Eagle, Wichita. "Wrecking Ball Demolition." *YouTube*, YouTube, 2017, www.youtube.com/watch?v=VP8KjbXuP8Y.

"Firefly Craft for Kids: Make Light-up Fireflies from Plastic Easter Eggs." The Decorated Cookie, 29 May 2019, thedecoratedcookie.com/firefly-craft/.

Garcia, Emma. *Tip Tip Dig Dig: Board Book*. Boxer Books Limited, 2013.

Hit Entertainment Limited. "*Beyond Playtime, into Real Time | Bob the Builder.*" Beyond Playtime, into Real Time | Bob the Builder, 2015, http://www.bobthebuilder.com/en-us/Content/ASSETS/Images/020Activities/050Blueprints/PDFs/BTB_Blueprint_06_MM_TOOLS_Digital_US.pdf

Howdini. "Drywall Repair: How to Fix a Hole in Drywall." *YouTube,* YouTube, 2009, https://www.youtube.com/watch?v=qvtoikKG318

Kids TV Channel – Cartoon Videos for Kids. "concrete mixer | formation and uses | videos for kids | construction vehicles." *YouTube,* YouTube, 2017, https://www.youtube.com/watch?v=tMK6IxxcTpM

Lawrence, Edward. "Roofing for kids." *YouTube,* YouTube, 2017, https://www.youtube.com/watch?v=ZXbZwvRhSG8

Learning Junction. “Introduction to Electricity – video for kids.” *YouTube,* YouTube, 2016, https://www.youtube.com/watch?v=Uf76pThNXZc

Manning, Mick, and Granström Brita. *Let's Build a House*. Franklin Watts, 2017.

Maple Leaf Learning. “Let’s Build a House.” *YouTube,* YouTube, 2014, https://www.youtube.com/watch?v=YBhJ8O7p2j8

Meiners, Cheri J. *Be Careful and Stay Safe*. Free Spirit, 2008.

Nakagawa, Chihiro, and Junji Koyose. *Who Made This Cake?* Front Street, 2009.

New Jersey American Water. “How Does Water Get to Your Tap?” *YouTube,* YouTube, 2012, https://www.youtube.com/watch?v=_AXtsOYnlXM

Paper Folds – Origami and Crafts. “How to fold / make an easy Paper “Standing House” – Origami Tutorials for Beginners” *YouTube,* YouTube, 2016, https://www.youtube.com/watch?v=8c3bJi2AUIU

Periwinkle. “Learn How to Make Origami House Roof | DIY House Roof For Kids | Periwinkle.” *YouTube,* YouTube, 2017, https://www.youtube.com/watch?v=i7uB9lm-si8

Rinker, Sherri Duskey, and Tom Lichtenheld. *Goodnight, Goodnight, Construction Site*. Chronicle Books, 2011.

Rinker, Sherri Duskey, and AG Ford. *Three Cheers for Kid McGear!* Chronicle Books, 2019.

Ritchie, Scot. *Look at That Building!: a First Book of Structures*. Kids Can Press, 2011.

Savage, Stephen. *The Mixed-up Truck*. Roaring Brook Press, 2016.

Singleton, Linda Joy, and Richard Smythe. *Crane & Crane*. Amicus Ink, 2019.

Sutton, Sally, and Brian Lovelock. *Construction*. Walker Books, 2016.

Sutton, Sally, and Brian Lovelock. *Demolition*. Walker Books, 2014.

Thomas & Bob Archive. “Bob the Builder: Meet the Team [Series 15] (US)” *YouTube*, YouTube, 2018, https://www.youtube.com/watch?v=fp_gauD9EQ0

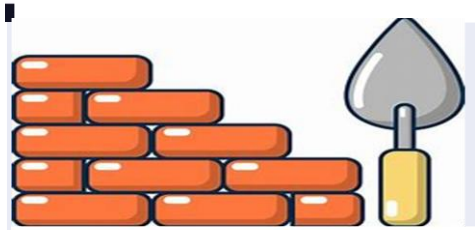
Twentytrucks. “Excavator for Children | Truck Tunes for Kids | Twenty Trucks Channel.” *YouTube,* YouTube, 2008, https://www.youtube.com/watch?v=MXhhXXsxSfE

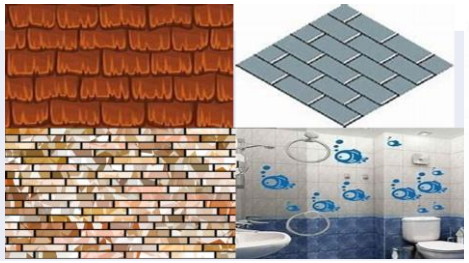
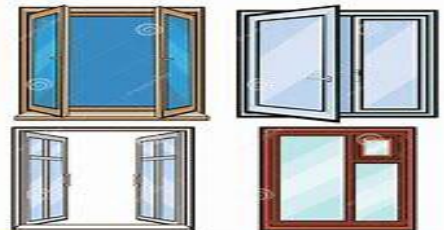
Twentytrucks. “Truck Crane for Children | Truck Tunes for Kids | Twenty Trucks Channel.” *YouTube,* YouTube, 2014, https://www.youtube.com/watch?v=bLfov3RhNhw

University of Nebraska – Lincoln. “Landscape Architecture for Kids: What is a Green Roof?” *YouTube,* YouTube, 2017, https://www.youtube.com/watch?v=RRta4aGJKfc

Vestergaard, Hope, and David Slonim. *Digger, Dozer, Dumper*. Candlewick Press, 2018.

YouTube Movies. “Bob the Builder: Teamwork - Clip.” *YouTube*, YouTube, 2014, www.youtube.com/watch?v=pJVjLGLaGHA.

B	U	I	L	D
				
				
				
				
				

B	U	I	L	D
			 	
				
				
				
				

1 – Build - Notes

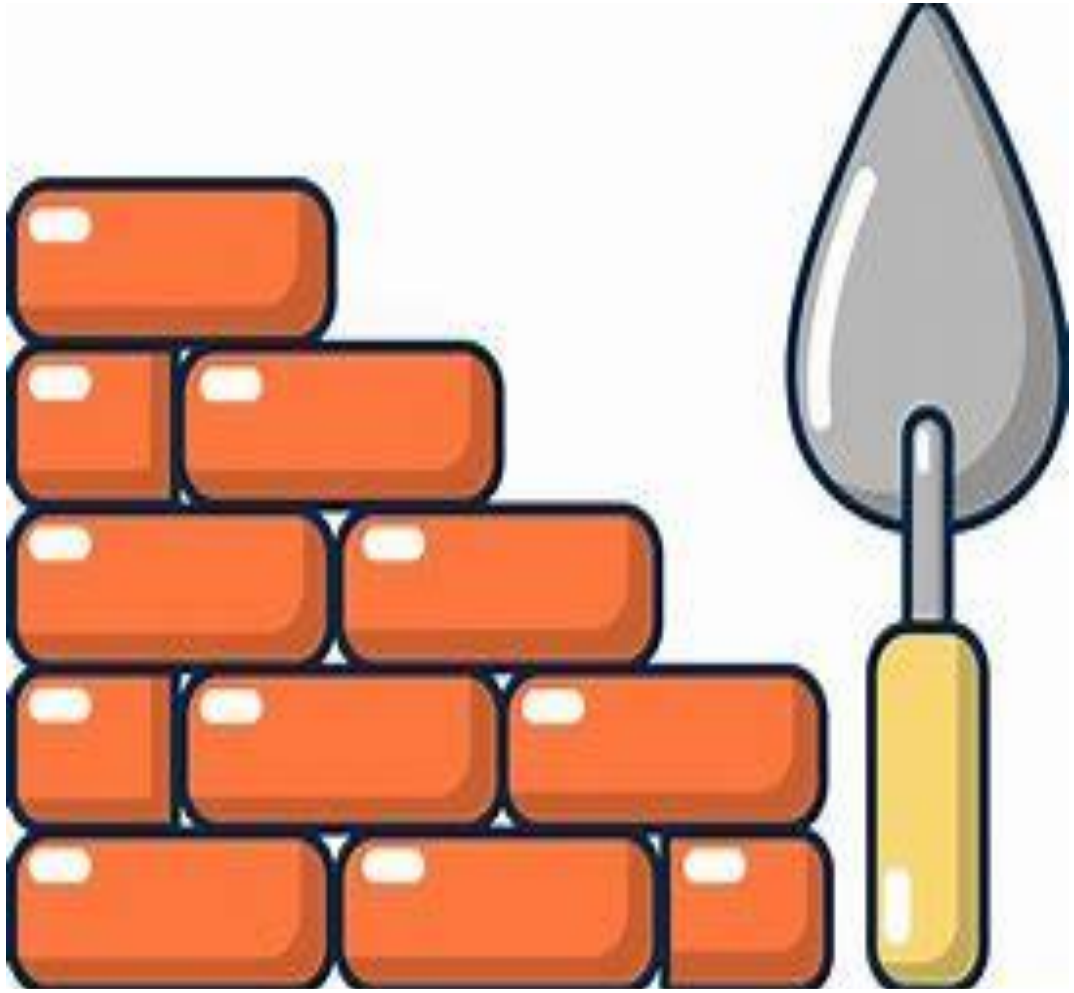
- Wood is used in many shapes and sizes
- Comes from trees
- Used to build the frame in houses and buildings
- Wood can be finished with colors either painted or stain can be rubbed on the wood
- Wood from different kinds of trees can be softer, or harder and used differently
- Wood can be treated to be water proof
- Wood is used to divide the rooms in a house or building

Build - Wood

2 – Build - Notes

- Brick is used to cover the outside of buildings
- It is also used for roads, patios, and as outdoor flooring
- Bricks are created by cooking them in hot ovens
- They come in many sized and colors
- They are held together with a sticky cement that holds them together

Build - Brick



3 – Build - Notes

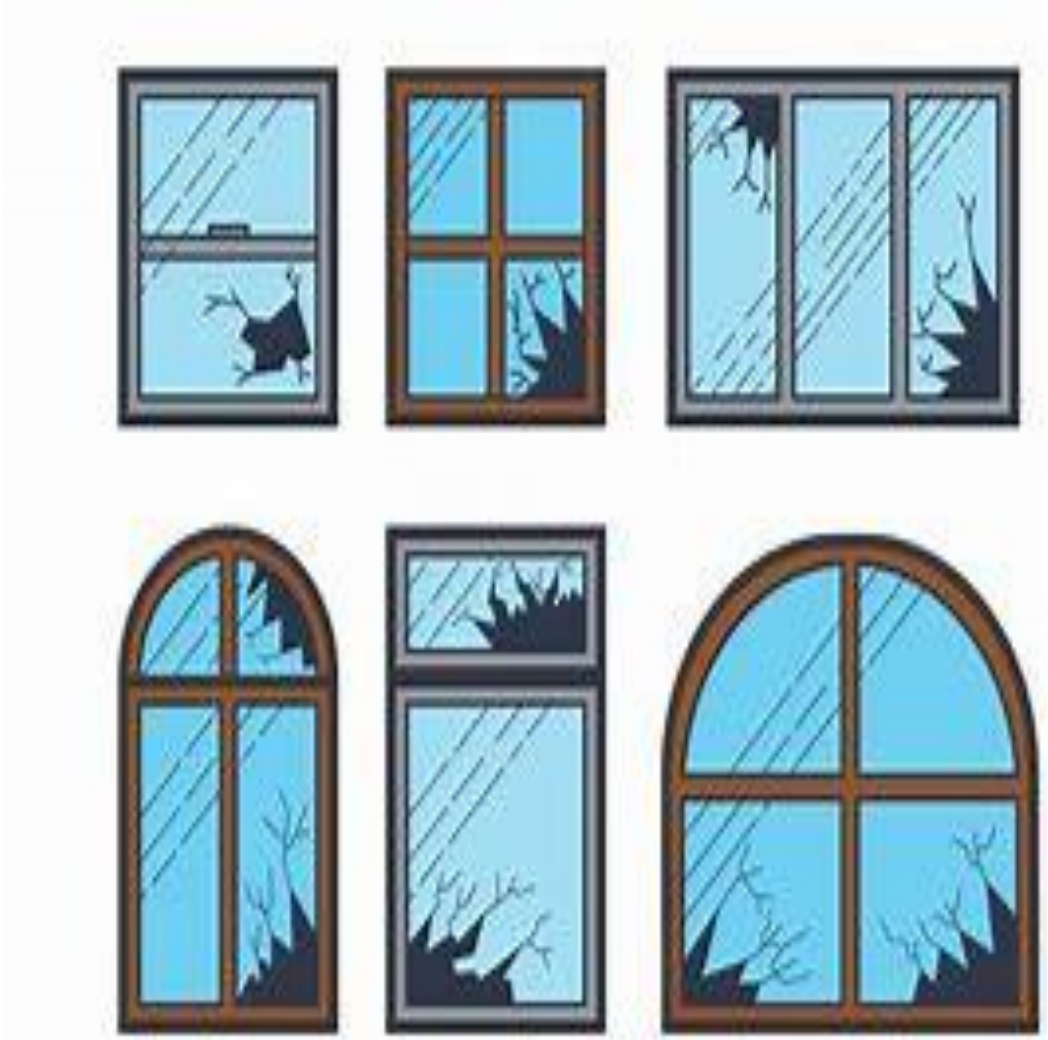
- Concrete is mixed and poured into many shapes and sized
- It is thick and when poured and dries hard
- It can be
  - made into bricks
  - poured into a slab for the base of a building
  - poured and made into walls
  - Poured into forms and made into steps
  - Used to build roads
  - Used to hold bricks together (like icing on a cake)
  - Formed to make a pool

Build - Concrete

4 – Build - Notes

- Glass is used to make windows and doors
- It is cut into many shapes and sized
- Some is strong enough to last in bad weather
- Some is tinted to keep the heat from the sun out
- It is fragile and can be broken

Build – Glass



5 – Build - Notes

- Trees and shrubs are used around houses and building to make the area look pretty
- They come in many different shapes and sizes
- Some are used to make sure that the dirt and area around the house or building do not move too much and interfere with the building
- Flowers are also used

Build – Tree/Shrub

6 – Build - Notes

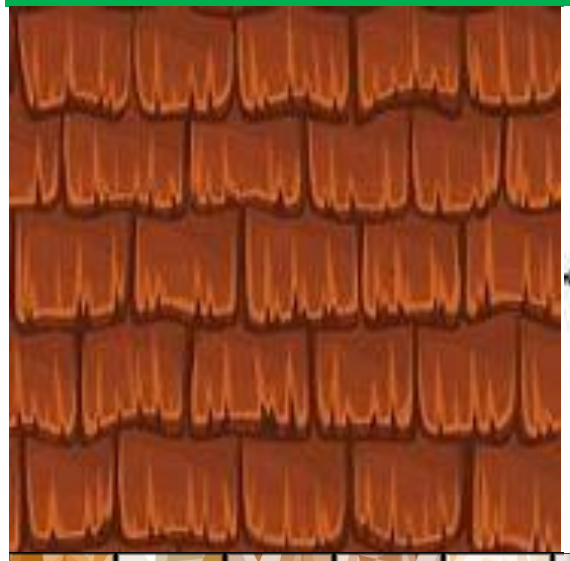
- Dirt has to be moved in most cases before building can start
- It is moved to make sure that when it rains the water runs away from the building
- Dirt called topsoil is used to plant grass, trees, shrubs and flowers
- The way the dirt is moved makes a big difference in how well the building lasts

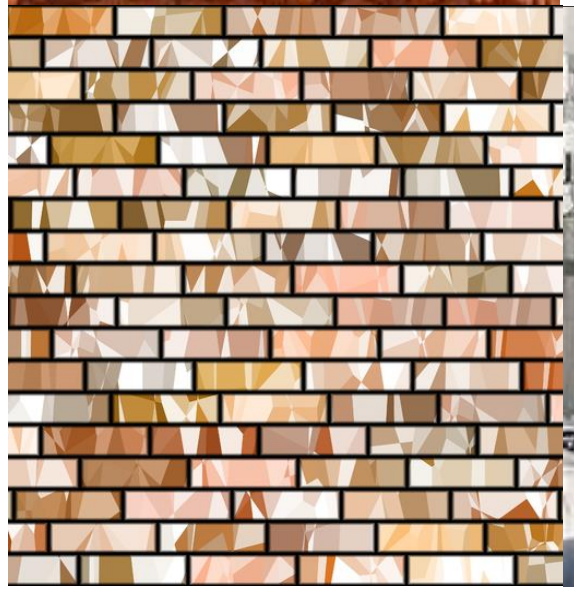
Build - Dirt

7 – Build - Notes

- Tile comes in many shapes and sized
- It can be used for the roof of houses and buildings
- It can be used to decorate walls or as floors
- It is used in kitchens and bathrooms as it is waterproof

Build - Tile





8 – Build - Notes

- Carpet is most often cut to fit the room
- It comes in many colors and textures
- It can help make a room quieter
- Carpets can be think and nice to walk on, or short and waterproof to use outside

Build - Carpet

9 – Build - Notes

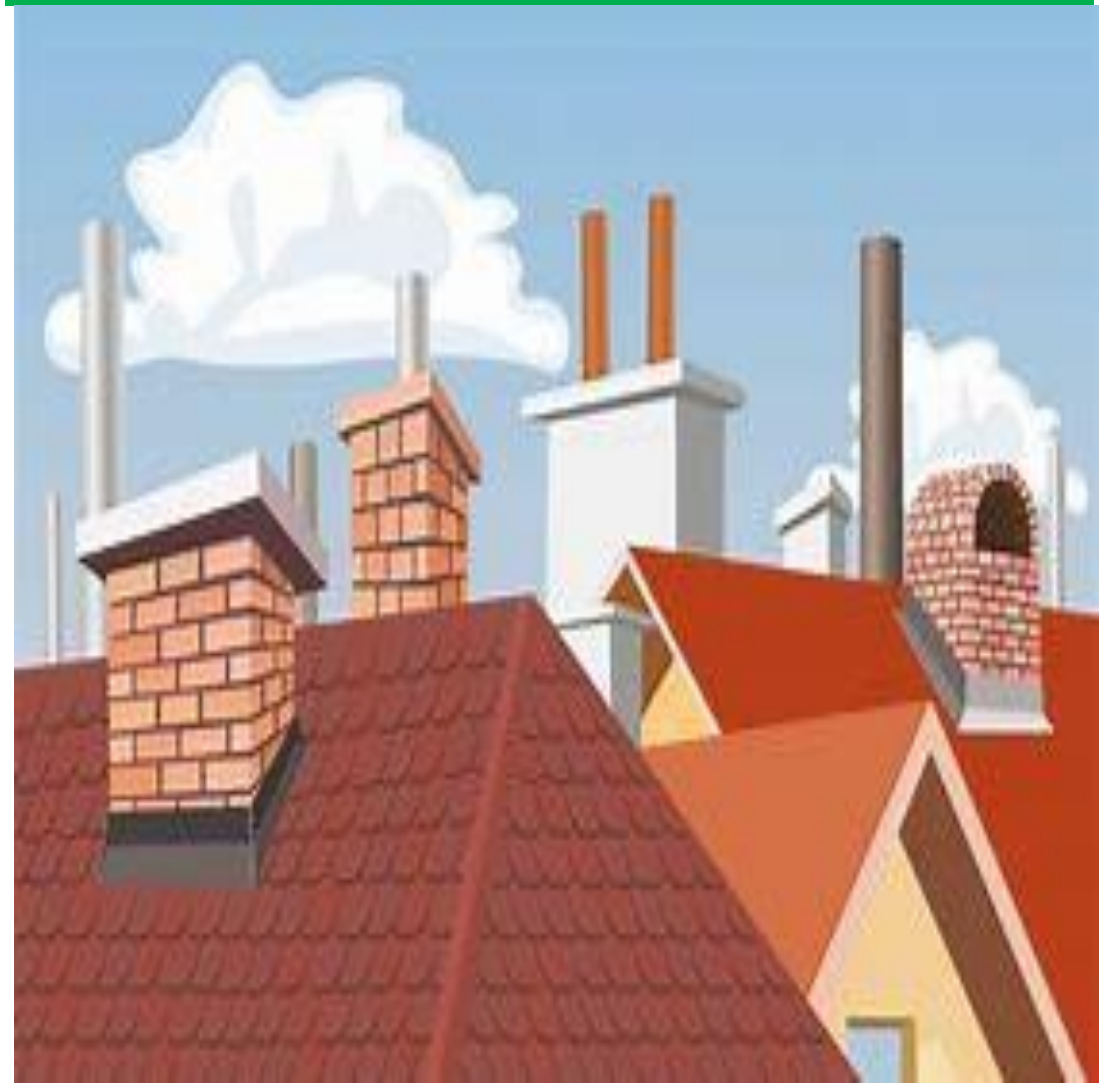
- Concrete and wood are used to make the frame of the building
- The wood divides the building into rooms
- Concrete is usually used on the bottom of the building to help make it stronger and to hold the wood up out of the water and dirt

Build - Frame

10 – Build - Notes

- Roofs can be made out of tile or shingles
- The roof has a tarry material under the tile or shingles to help keep the rain and weather out

Build - Roof



11 – Using - Notes

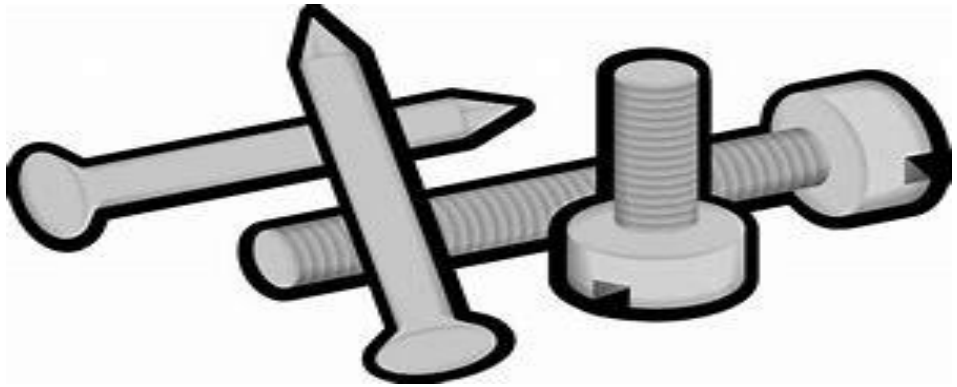
- Nails are used in wood and in cement to hold things together
- They are pounded in using a hammer
- Nails come in many sized, both in length and in width

Using – Hammer and Nails

12 – Using - Notes

- Screws come in many shapes and sizes, similar to nails
- They can be used to hold things together in wood, concrete, and many other types of materials
- Screwdrivers are used to insert the screws into the material
- Some screws have points on the end and some are flat

Using - Screws



13 – Using - Notes

- Cement Mixers are big trucks
- They have a tank in the back that can be set to turn slowly
- The turning keeps the cement from hardening
- The back of the Cement Mixer has a metal slide that lets the cement inside pour into where it will be molded
- There has to be wooden or some type of outlines to hold the thick liquid that is the cement
- Once the cement dries it is very hard

Using – Cement Mixer

14 – Using - Notes

- Wrenches are used to tighten or loosen screws, nuts and bolts
- Sometimes these types of screws are used to hold metal pieces together

Using - Wrench

15 – Using - Notes

- Paint is what lets us have things look the way that we want
- Paint can cover almost any type of material, like wood, brick, metal, walls and even tile
- Paint can be shiny or flat, or even have a texture
- We try to not get paint on carpet

Using - Paint

16 – Using - Notes

- Safety cones tell us that we need to be careful
- They let us know that there is danger or that we need to be extra careful in the marked area
- Sometimes Safety Cones are used to keep us completely out of the marked area
- Always pay attention to safety cones, they are put there for a reason to keep us safe

Using – Safety Cone

17 – Using - Notes

- Dump trucks are movers
- They are used to move dirt, gravel, rocks and other items to the construction site
- The back of the dump truck is filled and then the back can be lifted from the front, letting the contents to spill, or be dumped out

Using – Dump Truck

18 – Using - Notes

- Tower Cranes help reach high places and help to move heavy items like beams and concrete walls up to places that would otherwise be out of reach
- Tower Cranes can be different heights and have arms that are various lengths
- These Cranes are very useful but you have to be very careful around them

Using – Tower Crane

19 – Using - Notes

- The Backhoe is a digger
- It is used to move the dirt before the building begins
- There is a scoop in the front to move piles of dirt, concrete, sand or other materials
- There is a digger in the back to break up and dig up the earth

Using – Backhoe

20 – Using - Notes

- Safety Vests are a MUST for anyone working on or around a construction site
- They can be bright yellow or orange and they glow in the dark with the white stripes
- These vests keep workers safe as they are easily seen by other workers, especially those driving the heavy equipment used on construction sites

Using – Safety Vest

21 – Individuals - Notes

- Painters make our world colorful
- They can use brushes, rollers or even sprayers to put the paint onto all different types of construction
- Paint is used on the inside and on the outside of buildings
- We even paint stripes on our roads to help us know where to go

Individuals - Painter

22 – Individuals - Notes

- Landscapers do much more than cut the grass
- They , plant the trees, shrubs and flowers/plants that make the property look great and protect against the ground shifting (called erosion)
- After planting the landscaper will rake, weed our gardens, trim the trees, shrubs and flowers/plants

Individuals - Landscaper

23 – Individuals - Notes

- Plumbers make many things possible.
- They work with the pipes and faucets that lets us have running water
- Without plumbers we would not have working:
  - Toilets
  - Sinks with running water
  - Swimming pools
  - Fountains
  - Ice cubes
  - Bathtubs/showers
  - Sprinklers

Individuals - Plumber

24 – Individuals - Notes

- Electricians work with the wiring in our houses and other buildings
- They make sure that we have:
  - Outlets to plug in our phones, iPads and equipment
  - Fans to keep us cool
  - Lights so that we can see when it is too dark

- Can you name all of the things that you use that need electricity?

Individuals - Electrician

25 – Individuals - Notes

- Crane Operators sit high up in the crane
- They know how to move the arm to pick up heavy materials and they know how to move the materials to the exact spot that they are needed
- Crane Operators move the arm up and down and also to the sides. They even swivel the large arm around to place the load behind the crane

Individuals – Crane Operator

26 – Individuals - Notes

- Cement workers often take care of several roles. They often:
  - Drive the cement mixer
  - Make sure the cement is the right consistency (not to soft and not too hard)
  - Guide the cement from the truck down the shoot/slide into the form/mold
  - Spread the cement
  - Continue to work the cement to make it smooth

Individuals – Cement Worker

27 – Individuals - Notes

- The Carpenter is the person who puts the frame of the house or building together
- They not only build the frame; but also put up the walls, install the windows and doors and follow the plans to have everything come together
- Carpenters build new houses and building and also update, fix or change existing buildings

Individuals - Carpenter

28 – Individuals - Notes

- The Surveyor looks at the property lines and decides where the boundaries should be marked
- They also look at the property to determine where the building should be placed and even where the landscaping should start and stop
- The Surveyor makes sure that buildings and parking lots are in the right spot and not too close to the road or other structures

Individuals - Surveyor

29 – Individuals - Notes

- Carpet/Tile Workers put down our flooring
- They also put the tile up in the kitchen, the shower, the bathrooms, in swimming pools and even outdoor carpet/tile
- Building like shopping malls, hospitals and even office buildings often have tile used as decorations throughout the building

Individuals – Carpet/Tile Worker

30 – Individuals - Notes

- Excavators use the backhoe to dig up the ground
- This is usually done before the building begins; but often continues during the construction process
- The Excavator digs up dirt, sand and even rocks or limestone from the ground
- They move what they move either to other locations on the property or sometimes place what they remove into dump trucks to be hauled to a different location

Individuals - Excavator

31 – Leveraging - Notes

- Toilets are one of the items that make our lives easier
- Plumbers install toilets and fix them when they are broken
- Before there were toilets, people had to use out houses, small buildings outside of the house that had a bench with a hole for you to sit on. They didn't smell very good.

Leveraging - Toilet

32 – Leveraging - Notes

- Faucets can be found both inside and outside
- We use them in the bathroom (sink and shower/bathtub, the kitchen, laundry room and even outside to water the grass and wash the car
- Plumbers install the faucets and fix them when they are broken
- Before faucets and indoor plumbing, we had to bring water in from the well or the stream
- Can you name all the ways you use water?

Leveraging - Faucet

33 – Leveraging - Notes

- Electricians install lights and fans
- We use lights in every room and have fans in many rooms, especially if we live in warm areas
- If we need to move a light or a fan we have to call an electrician

Leveraging – Fan/Light

34 – Leveraging - Notes

- We have sinks in the kitchen, the bathroom and often in the laundry room
- In public bathrooms there are often several sinks
- Can you name how things would be different if you didn't have any sinks?

Leveraging - Sink

35 – Leveraging - Notes

- Landscaping gives personality to our houses, our towns and our buildings
- Trees, shrubs, flowers, paths, hills and lighting make a huge different in the appearance of our surroundings
- Landscaping is planned, just as the building is planned

Leveraging - Landscape

36 – Leveraging - Notes

- Elevators and escalators help us in buildings that have multiple floors
- If we did not have these, we would have to walk up and down stairs
- Both of these require electricity and require an electrician to help install them
- Can you name places that have elevators or escalators?

Leveraging – Elevators/Escalators

37 – Leveraging - Notes

- Drywall is used over the frame of the house or building to make our walls
- Drywall comes in sheets and is cut and fit where it covers the frame. The seams need to be coated and smoothed out so that it looks like one big sheet
- In older houses plaster was used; but homes and buildings now use Drywall which is lighter and easier to use
- The Drywall is then painted to make it look the way we want it to look

Leveraging – Walls/Drywall

38 – Leveraging - Notes

- Windows come in many shapes and sizes
- They can be small, round, square, curved or even across an entire wall, like sliding glass doors
- Windows let light and air into our buildings; while keeping the environment out when they are closed
- Windows are typically made of glass
- They can be made of a special glass that is strong enough to hold up against high winds
- Windows can be broken, so we have to be careful around them

Leveraging - Windows

39 – Leveraging - Notes

- Roads connect us to each other and to the places that we need to go
- Roads are planned, just like buildings are planned
- Building roads is a part of construction
- Can you name some places that you take roads?

Leveraging - Roads

40 – Leveraging - Notes

- Pools are a part of construction
- They can be used as a part of the landscaping
- They can have fountains or waterfalls, or have spas
- Pools require the work of an electrician and a plumber

Leveraging - Pools

41 – Developing - Notes

- When you think about construction, you probably think about houses
- Houses come in many sizes and shapes
- Often houses within a community are similar
- Every house that is built requires a team to build it, with:
  - Architect
  - Surveyor
  - Carpenter
  - Roofer
  - Plumber
  - Electrician
  - Painter
  - Carpet/Tile Worker

Developing - House

42 – Developing - Notes

- Hotels are another type of building
- They have many rooms, each with bathrooms and bedrooms
- It is important to keep everything in the best running order, as people pay to stay there every night. That means the lights, outlets, plumbing and items that require electricity have to be perfect
- Hotels have elevators and/or escalators that also need to be kept working at all times

Developing - Hotel

43 – Developing - Notes

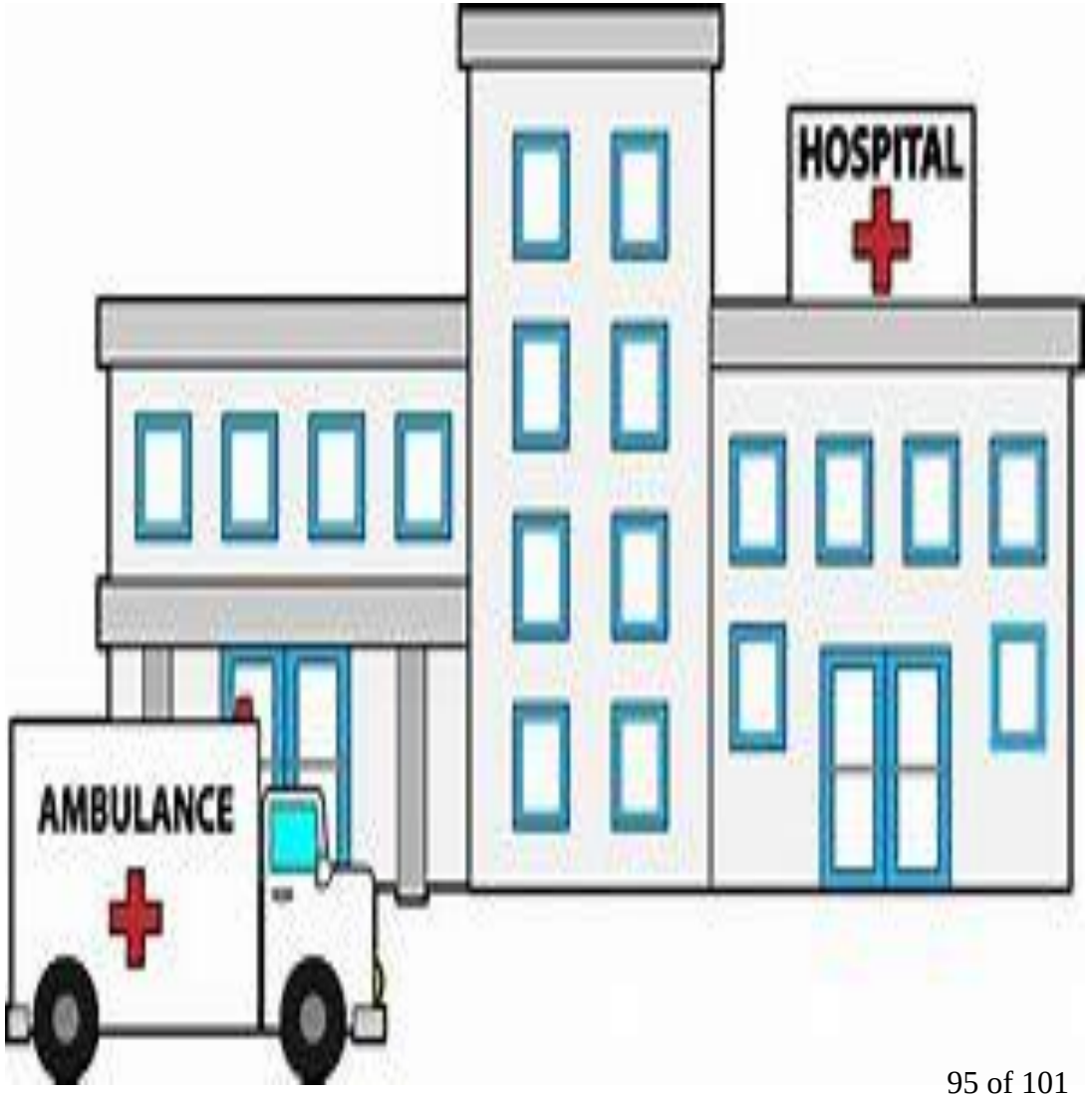
- Schools require special planning before construction starts
- Each room requires appropriate lighting
- Each bathroom has to have several toilets and sinks
- Special rooms like cafeterias, gyms and auditoriums need to have special equipment or seating
- Can you name things in your school that require electricity? Those things would require the work of an electrician

Developing - School

44 – Developing - Notes

- Hospitals are a very special kind of building
- They have to have many rooms that are set up for the specific needs of caring for people who need help
- Even the walls of hospitals have pipes in them that carry oxygen and medicines to each of the rooms
- It takes a lot of planning and a team that knows how to set up all of the electricity, the plumbing for each room, and the pipes with special gases and medicines
- Hospitals have large elevators to carry patients in their beds
- There are lots of inspections that happen while a hospital is being built

Developing - Hospital



45 – Developing - Notes

- Office buildings come in many shapes and sizes
- In cities, office buildings can be very high
- They are often made of steel and have many windows
- Often the space inside an office building can be easily changed to meet the needs of different companies
- Electricians and plumbers are critical to the success of an office building, as they have to plan for almost every need
- Landscaping is also important when planning an office building, as you want the building to look good

Developing – Office Building

46 – Developing - Notes

- Apartment buildings have special needs, as they have to have working bathrooms, kitchens and electrical outlets for each apartment so that each family living there has hot water and everything that they need
- Some apartment buildings have elevators
- Often an apartment is painted every time a new family moves in
- It is important to keep the common areas, the outside paint and the landscaping nice so that people want to rent the apartments

Developing - Apartment

47 – Developing - Notes

- Shopping malls have to be built to have space for lots of shoppers
- They usually have escalators and elevators if they have multiple levels
- The space inside can usually be changed so that the stores can be changed
- There are often fountains or special decorations to make the main areas special and pretty
- Many shopping malls have a food court area that requires special planning during construction. This allows the area to have cookers, warmers and large refrigeration areas to store food and drinks

Developing – Shopping Mall

48 – Developing - Notes

- Playgrounds require planning and construction even though they do not need electricity or running water
- Safety needs to be considered when constructing a playground
- The ground is sometimes covered with a soft cork type material to make it easy to walk and run around
- Landscaping is also planned carefully so that you are not running into things; but that it looks pretty
- Often there are public bathrooms and drinking fountains nearby

Developing - Playground

49 – Developing - Notes

- Water Parks take a lot of planning
- Not only does the plumbing need to be considered; but safety of each pool and water slide have to be planned
- Areas need to be planned for public bathrooms, changing areas and often lockers. All of these areas need to have walls and floors that are waterproof
- Most Water Parks also have food areas, so there has to be the necessary electricity for refrigeration and cooking equipment
- Landscaping is important because you want the area to look inviting

Developing – Water Park

50 – Developing - Notes

- Bridges are also a part of construction
- They can be short or long, low or tall
- Bridges need to be build to go over:
  - Water
  - Railroads
  - Roads
  - Rocky areas

- Can you give some examples of bridges that you have gone over?

Developing - Bridge